P.N.E.U. NOTES.

Belgravia and Westminster Branch. A meeting of the Belgravia and Westminster Branch was held at the High School, Graham Street, Eaton Square, on Saturday, April 25. The Rev. J. E. C. Welldon, Head Master of Harrow, gave a lecture on "The Relations between Parents and Teachers." (See report, p. 265.) Sir R. Templeton took the chair. Mr. Welldon's address was listened to with great interest and delight.—Hon. Sec., The Lady Isabel Margesson.

Hampstead and St. John's Wood Branch. April 16. A paper on "The Effects of the Examination System" was read before this Branch by Mr. Mark Wilks, jun. The meeting was held at 9, St. John's Wood Park, by kind permission of Mrs. Schofield. Our hostess's brother-in-law, Dr. Schofield, took the chair, and there was a good attendance. May 11, at 31, St. John's Wood Park, Drawing-room Meeting for men only. Mr. H. S. Perrin in the chair. Mr. A. H. Tubby, M.S., M.B. (Lond.), continued his previous lecture on "Heredity," showing how the sins of the fathers are visited upon the children, and urging that the dangers open to them be plainly pointed out to boys by their fathers. Rev. A. Cherrill, Mr. Cumberland, Mr. Hobson, Mrs Kitching, and others, took part in the discussion that followed. At our last monthly meeting, May 21, Miss Drewry read a paper on "Rewards and Punishments," followed by discussion, opened by Mr. Cumberland, Head Master of the William Ellis School, Gospel Oak. Mr. Edmund Blyth will presided at the meeting, which, by permission of Dr. Tremlett, was held in the Lecture Hall of St. Peter's, Belsize Park.—Hon. Sec., Miss E. C. Playne.

PRIZES.

Awards.—Miss Morse awards her prize as follows :—

(1) *Buttonholes*, Miss Mildred Winthrop, Half-a-guinea ; her work could hardly be excelled.

(2) *Smocking*, Mrs. Leader, Half-a-guinea. The specimen sent in by Mrs. Lucius Smith is almost as beautiful a piece of work.

Mr. E. P. Arnold-Forster awards his prize for—

(3) *Model Engine* to Richard Jefferson, aged sixteen. One Guinea. An ingenious work.

Lady Aberdeen awards her prize for a list of—

(4) *Twelve Hymns*, to be committed to memory by children under twelve, to Hon. Mrs. Cropper, Half-a-guinea.

(5) For *Twelve Poems*, do., to Mrs. Russell Grenville, Half-a-guinea.

(6) Miss Behrens awards her prize for *Translation of Passages from the German* to Miss Maud Lloyd, One Guinea, who deserves high praise, not only for her rendering, but for her clever reproduction of the original metre. Miss Thomas's prose translation is very good, and Miss Picton-Warlow's blank verse is excellent.

Competitions.—(1) The Competitors for "Twelve Rules for the Nursery" are requested to add a short article on "The Management of a Nursery, giving arrangement of hours for rising, toilettes, meals, airings, for a family of little children ; including the amount of needlework done by nurse and nurserymaid for a family of six under ten years of age." If competitors will be good enough to send in by June 15, we shall still be able to announce the award in the July number. Rules and Article.

(2) Mrs. W. D. Hall offers a prize of One Guinea for "The best paper on Living English Musicians." To be sent in by the last day of June.

Both competitions to be sent to Editor, care of Publishers.

THE

PARENTS' REVIEW

A MONTHLY MAGAZINE

OF HOME-TRAINING AND CULTURE.

"Education is an atmosphere, a discipline, a life."

SNAILS AND SLUGS.

By R. F. Scharff, Ph.D., B.Sc.

Snails are provided by Nature with a hard shell, which protects the soft parts of their bodies. They are included in the large group of Gasteropoda, which are distinguished from other Mollusca by the fact of the under side of their body being expanded into a foot on which they crawl.

They are not such simply organised animals as might be thought. Like the higher animals, they possess a heart, a fairly complex digestive organ, and a nervous system radiating into every part of their body. But while the nerves in the former arise from a brain, in snails they radiate out from a mass of nervous ganglia which takes the place of a brain, and which surrounds the throat like a collar. The land, and some of the fresh-water, snails breathe air, like ourselves, by means of lungs ; whilst the others have gills suitable for absorbing air from water as fishes do. But, of course, these and all the other organs are of a much more simple nature than in the higher animals.

Most snails live on land—and they may be found in the very driest places, even in the Desert of Sahara—some in ponds and rivers, and some in the sea.

Of land snails more than 6,000 species have been named and described (of which number about eighty species inhabit the British Isles), and they are to be found all over the world, from Tierra del Fuego in the South, to Greenland in the North. They vary in size from the great Bulimus of Brazil, which is five inches long and thick in proportion, to the tiny Vertigos, which live in our woods amongst damp moss and fallen leaves, and some of which are as small as a pin's head.

Their shells vary as much in beauty as they do in size. Some are of brilliant colours with dark bands—such as Helix nemoralis, varieties of which are found of bright purple, and of all shades of brown and yellow—and some of elegant forms, such as the little trumpet-shaped snail, Clausilia, which is found on the trunks of trees.

Both of these are very common in the open country, but the snail with which many of us are most familiar is Helix aspersa, which may be found in any garden, sticking on the walls, or on the stems and leaves of plants.

This snail carries a dull-coloured brownish shell on his back. It measures about an inch in length and width, and is in the form of a spiral, curving inwards, generally from right to left. This is the snail's house, which he can shrink up into when danger is near, and then he is tolerably safe from his enemies the birds, which will eat him if they get the chance. Only birds with strong bills, such as the crow, are able to break the shell.

But though the snail can stretch part of his body out of the shell, he cannot leave it altogether; it is really part of his body, being a kind of hardened skin, and if he was torn from it he would die. However he has the power of repairing injuries done to it, by secreting carbonate of lime, which enters largely into the composition of the shell, from the mantle. The "mantle" of the snail is the loose skin covering the part of the body behind the head.

The mother snail exhibits an instinctive care for her young, like the higher animals and insects, and places her eggs where they will be safe from injury, and open to the influences of air and heat. She lays them in the ground, buried about an inch or two beneath the surface, during the spring and autumn, thirty or forty of them at a time. They are small and round like little white pearls.

The baby snail comes out of the egg with his shell on, and as he grows larger it grows too, and always just fits him.

The life of a snail is not a very long one. He is full-grown when about a year old, and generally dies before he is two, though there are many known instances of snails having lived much longer, some having been kept in confinement for six years.

If we take a snail and set him on a table before us we shall see how he moves along. First we see nothing but the shell, then it moves a little, and from under it the head comes peeping out, turning from side to side, as if to decide which way to go. There are two pairs of horns, or "tentacles" as they are called, on the head. One pair is long and points forward, and the other is shorter, and is placed beneath. At the tip of each of the long tentacles there is a little black dot; these dots are eyes, but they are not of much good for seeing, as the snail has very limited powers of eyesight. He can probably not do much more than distinguish light from darkness, and he is guided mostly by his sense of touch, which is very keen. The tentacles are especially sensitive; they are sometimes stretched out quite far, and sometimes, when they are touched, or come against anything rough, they are drawn in close, so that they hardly project from the head. If we observe them closely, we shall see that they double inwards, something like the finger of a glove which is pulled inside out.

There is an often-quoted passage in Shakespeare's "Venus and Adonis" descriptive of the sensitive way in which the tentacles recoil when touched—

> . . . the snail, whose tender horns being hit,
> Shrinks backward in his shelly cave with pain,
> And there, all smothered up in shade doth sit,
> Long after fearing to creep forth again.

Behind the head, and just beneath where the upper edge of the shell touches the body, there is a little hole in the body of the animal, which we may observe to open and close again from time to time. This is the opening into the lung, the breathing apparatus of the snail; and after he has taken a good breath of air by opening the hole he closes it again, lest any intruder, such as a tiny fly or a beetle, should find its way into it.

When the snail is satisfied that there is no obstruction in his way he sets off, and then we can see how curiously he moves.

He glides along as if he was swimming on the surface of water, instead of on a dry table, and if we let him have a sheet of glass to go on, we can see how he does it, by turning the glass over, for he goes just as well when turned upside down. In the first place we see that he has no legs or feet; the whole under side of his body touches the glass, and this is called his foot, though it does not look very like one. If we watch it, as he moves along, we see dark bands seeming to pass along it like the shadows of ripples on a sandy shore. These are muscles, and they push him forwards. The thick, sticky slime which covers the snail's foot, and which marks the path he has taken with a shining trail, makes his progress more easy. It looks as if it would be a smooth and pleasant way of getting over the ground, but it has some disadvantages, for the snail can only go at one pace. He cannot hurry away if he is frightened, nor can he go slower if he is tired; his only resource is to stop and to retire into his shell. In this respect he is like a clock which we may set going or stop at will, but we cannot force the wheels to change their rate of velocity.

These garden snails can do without anything to eat and drink for a long time, but their natural food is green leaves, and in spring they are very mischievous in the garden, for they bite off long tender shoots of the plants just sprouting from the ground, more than they can possibly eat, and leave them to wither.

Their mouth is very well adapted for biting leaves. It has a horny upper jaw, which closes on a tongue, or "lingual ribbon," which is covered with numerous little hooked teeth, and these act like a sharp file on what he bites. Take a cabbage or lettuce leaf on which a snail has been making his dinner, and you will see that a number of semicircles have been quite neatly and cleanly cut from the edges; or else, perhaps, he has set to work in the middle of the leaf and you see the traces of his file-like teeth in the scraped surface.

In cold countries the garden snail retires into some hole, or gets under stones in winter, and takes a long sleep, first closing up the opening of the shell with a lid or film of hardened slime, leaving a tiny hole which lets in enough air for him to breathe. In this state some specimens have been known to remain for more than two years, without food or water, and seldom breathing.

But some other species of snails are even more tenacious of life. The most remarkable instance of a snail remaining long in

a comatose state, is that of the Desert Snail from Egypt, which Dr. Baird has chronicled in the Annals of Natural History. A specimen, supposed to be a dead one, was fixed to a tablet in the British Museum on the 25th of March, 1846, and on the 7th of March, 1850, it was observed that he must have come out of his shell at some time during that period, as the white paper covering the tablet had been discoloured, apparently in his attempt to get away; but finding escape impossible he had again retired into his shell, closing up the aperture with the usual lid of glistening film. When immersed in tepid water he showed his vitality by again emerging from the shell. He had thus lived for at least four years without any nourishment.

Land snails were used as food by our forefathers in England even so recently as two hundred years ago—as Evelyn in his diary, written about 1650, describes the apple-snail, Helix pomatia, as "huge, fleshy, and delicious," and they are still so used in France and many other countries, where they are considered a very good and nutritious article of food. The so-called edible snail, Helix pomatia, is about twice the size of Helix aspersa, described above, and is rather thick-shelled, and of a light brown colour. In England it is found only in the South, and it was for a long time thought to have been introduced by the Romans, who used it as food, but this opinion is probably erroneous, as this snail is not a native of Italy.

Freshwater snails are to be found in every pond, ditch, or stream, except where the water is much polluted by the refuse of mills and manufactories. The species are not numerous, but very widely distributed. One common form, Planorbis, has a flattened shell, like a tiny coil of rope; another, Lymnaea, is more like a whelk shell, but very much smaller—one species, Lymnaea stagnalis, being sharp-pointed and with a large opening.

In Lymnaea and Planorbis the tentacles are flattened, with the eyes at the base and not on the top, as in the Helices.

These water snails glide along the surface of the water, shell downward, looking like our garden snail when we reversed the sheet of glass which he was crawling on; or else they move along the stems of water plants, on the decaying leaves of which they feed.

As we have said before, these water-snails breathe, like the land-snails, by means of lungs, therefore air is necessary for them, and when they are in need of it they have to come to the surface. It is curious to note that the lungs of some other species of Lymnaea appear to have become adapted for absorbing oxygen from the water as the gills of fishes do. In this way they take the place of gills, in enabling the animal to live always under the surface of water, the snails which possess them living permanently at the bottom of the lakes which they inhabit.

Pond-snails spend the winter buried in the mud at the bottom of the pond they live in, and if the water should at any time get dried up, they close the aperture of their shell with a film, as the land snails do in the cold, and remain safe for a length of time, in a state of coma.

Their eggs look like a transparent lump of jelly.

These water snails are useful inhabitants for a fresh-water aquarium, as they help to eat the decaying leaves of the water weeds and the green algæ, which grow so quickly over the glass sides.

Of the large number of sea shells which may be included in the class of Gasteropoda, and which we may look upon as sea-snails, we can only mention a few.

The limpet, the periwinkle, and the whelk are among the most familiar of the shells which we find lying empty on the beach, or see at low tide, sticking fast to the rocks.

They use their "foot" as a sucker, and some of them, the limpet especially, fasten on to the rock so tightly, that it is quite hard to remove them, and they stay motionless for hours together, looking like a piece of the rock itself. But watch them for a while when the tide is coming in, and you will see that as soon as the water reaches them they will raise themselves from the rock and move much in the same way the land snail does.

All these three species are used as food in various parts of the British Isles, and the whelks are largely employed as bait. The periwinkles and whelks instead of being vegetable feeders like their near relatives, the land and freshwater snails, are carnivorous, and feed on such shells as limpets and mussels. The whelk burrows into the sand in search of its prey, and is provided with a long proboscis, through which it can breathe while doing so.

The Dog's whelk is another carnivorous snail, which has a boring apparatus with which it can bore through the shells of mussels and limpets and get at them that way.

From another species of the same genus, Purpura, the ancient Romans extracted a dye—the famous imperial purple. It was

probably the difficulty of obtaining it, each shell only containing a very small quantity, which caused it to be so prized—as the colour is a dull reddish purple, not very beautiful.

Like snails, most slugs have shells, but they are not external, being hidden under the mantle, which, as I explained before, is the part of the skin covering the fore-part of the body. In German, slugs are called "Nacktschnecken," naked snails, a name which describes them extremely well.

Many people dislike slugs very much. They call them nasty slimy creatures, and are afraid of touching them, but this is very foolish, for slugs are quite harmless; and when we know something about them, and have observed them well, they become as interesting to us as any other living creature which we study and observe.

As slugs cannot take refuge in their shell, as snails do, they would easily fall a prey to birds, but that they have other means of protection.

We may often have asked ourselves why some wild animals have bright colours in their skin or fur, while others are always dark. Among domestic animals there are very wide differences in the colouring of individuals of the same species; but in wild animals this is not the case. In rabbits, for example, pet rabbits are of white or of various shades of brown, red, or yellow; whilst wild rabbits are almost invariably of brown, and if we consider the life and habits of the latter we see that this colouring is useful to it to help it to escape observation, and instances might be multiplied, for all animals which have enemies to fear are coloured so as to help their escape.

Like wild animals, slugs have protective colouring, and as, in addition to this, they chiefly come out at night from their hiding places to feed, they are pretty safe from birds, and increase and multiply so fast that gardeners have to wage a constant war against them to save their flowers and vegetables, and there is hardly a garden where they may not be found in numbers. They are most numerous, however, in heavy clay soil, which is generally damp, and where they easily find shelter in worm-burrows, and they are less common in dry, sandy soil.

They vary very much in their destructive powers; some only eat fungi, or withered and rotten vegetation, so that they are rather useful than otherwise, but the kinds which occur in the greatest numbers are also the most mischievous. These are

Arion ater and Agriolimax agrestis. The former is one of the largest of British slugs. It often attains the size of from three to four inches when fully expanded. It is a species which varies very much in colour according to its surroundings. Those most frequently found in gardens are a bright rich brown. It has a curious habit of hunching up its back and rocking itself from side to side when it is irritated by being touched.

The Agriolimax agrestis is very much smaller. It varies in colour from white to a speckled brown, and gets darker towards winter, when the leaves, under which it is in the habit of sheltering through the day, wither. It might be thought that its white colour in summer would make it conspicuous, but as it feeds chiefly in the evening and early morning, when the dew is heavy, it is not easily distinguished.

One species of Slug—the cellar-slug—inhabits cellars and out-houses, and may be traced by its slimy track. It will feed voraciously on any kitchen refuse that may be within reach, but at daybreak it creeps away into shelter, and during the day is never seen.

A very curious slug-like snail is the Testacella. It is slug-like in so far that it bears a general resemblance to a slug, but it differs from one in the possession of a small external shell which it carries on its tail, like a nail at the end of a finger. It is a couple of inches long, and lives entirely underground, where it feeds upon earth-worms. It follows them about in their burrows, and when once it has seized a worm by one end, there is no chance of escape for it.

Shells may be said to be among the best objects for an amateur's collection. They may be preserved easily, as they do not suffer from mould or the many other causes which destroy collections of insects. Land shells also have the advantage of being easily obtained, and the animals which they contain can be instantaneously killed by throwing them into boiling water. When dead they can be removed with a pin, and then the shell is ready for naming and placing in the collection.

It must be remembered that "dead shells," that is, shells found empty, are of much less value from a collector's point of view, as they have been injured in most cases by being rolled about, and have lost the vivid colours they possessed originally. For this reason land-shells are a better subject for collecting than sea-shells, as they are more often found alive. In making a collection of them, the place where they are found should always be noted down. This is most important, as there are many problems still unsolved about the reasons for the peculiar distribution of certain snails, and how their colour is influenced by the place they live in,—mountain or valley, wood or field. These and many other points might have been decided long ago had all collectors observed this rule.

A study of shells has this in common with that of every other branch of Natural History, that it brings out the faculty of observation, and the mind early trained to the habit of observation in small things will reap the benefit of it in after life in more important ones.